LPG DEPOT INVESTMENT AT COASTAL AREA OF THE PRC

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MBA PROJECT REPORT

Presented to

The Graduate School

In Partial Fulfilment

of the Requirements for the Degree of

MASTER OF BUSINESS ADMINISTRATION

THREE-YEAR MBA PROGRAMME

THE CHINESE UNIVERSITY OF HONG KONG

May 1992

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Acknowlegement

I would like to take this opportunity to thank my advisor, Prof. K. C. Mun, for guiding me through this paper.

Also thanks to my colleagues and the dealers for supporting me in the field research to gather valuable information.

Table of Contents

CHAPTER I

INTRODUCTION

Following the open door policy adopted in the early 80's, economy of China has been growing considerably. Notwithstanding the June 4 event happened in 1989, China managed to record a multi-folded economic growth in the last decade as tabulated below :

Table 1

Gross National Product

	(Billion Yuan)	% Growth	A.A.I. (%)
1978	358.8		
1980	447.0	24.6	
1985	855.7	91.4	
1988	1398.4	63.4	
1989	1578.9	12.9	14

Source : China Statistical Yearbook 1990

Unsurprisingly, the performance along the coastal regions (especially those Special Economic Zone, or SEZ, and Open Port Cites) are most overwhelming :

Table 2

Gross Output Value of Industry, including Counties at 1980 Constant Prices (Billion Yuan)

	1987	1988	1989	A.A.I. (%)
Dalian	13.2	19.0	20.3	24
Tianjian	37.2	44.2	48.1	14
Shanghai	98.0	108.6	134.0	17
Guangzhou	21.5	26.8	28.0	14
Shenchun	5.9	9.1	12.0	43
Zhuhai	1.3	2.6	3.3	59
Shantou	6.8	9.6	9.4	18
Xiamen	3.3	4.7	5.7	31

Source : China Statistical Yearbook 1988, 1989, 1990

There are, of course, numerous factors leading to such an economic growth. To mention a few : a relatively political stability, favourable investment environment (e.g. Low/preferential tax rate, sufficient supply of resources) which have encouraged foreign investment.

It is easily noticeable that China has abundant supply in resources such as land, labour, water and even energy. Yet the strict central planning system in allocation of energy resources (some meant for export for foreign currency) has resulted in its comparatively tight supply in the fast developing coastal region, especially for high quality gas-fuel to satisfy the industrial demand, such as paper making, bakery, alloy annealing. These industries require cleaner fuel with good control over attainable temperature to guarantee product quality.

In addition, following the global move towards environmental protection, the Chinese Government has started to look into it more seriously. Now, the Government will no longer accept an industrial development project which poses a potential threat to the environment, even if it comes with the promise of much sought after foreign investment capital. Environmental protection has become a new criterion for investment project assessment, particularly air protection. The facilities for prevention and control of air pollution must be inspected and approved by

the relevant environment protection agency before a project can be put into operation. As a result, demand for high quality gas fuel has been increasing in industrial usage.

Although gas fuel is a comparatively higher priced energy source in domestic consumption, its demand (in the coastal cities) has been growing fast in the past few years. There are several reasons for this of which, a major one has been the increase in the average income of people in these cities. The families now have the money to spend than before and consequently have a desire to improve their living standard. Gas supplied by cylinders has provided families with advantage of time saving and convenience as compared with the traditional means of burning charcoal/coal. Government's control of air-polluting solid fuel and growing consumers' awareness of environmental protection are also favourable factors for using the gas supplied by cylinders.

Demand for gas fuel particularly the LPG (a popular type of gas fuel), has rapidly been increased in the past years and with reasons to be discussed in later chapter, the marketing opportunities for LPG appear to be promising and profitable.

CHAPTER II

OBJECTIVE

Currently, most foreign gas suppliers entered the LPG market of the coastal cities by using the importation method (i.e. supplied in a case by case pattern, either CIF or FOB, in bulk to designated ports by using gas tankers) which offers low risk and immediate cash return. For the purpose of becoming a major LPG supplier and forming a base for a market penetration in the future, an investment of gas storage depots is necessary.

Being the market leader of LPG in this far east region, **Shell Company**'s position in the market and how it could further exploit the market potential by such depot investment(s) are to be discussed.

The objectives of this paper are :

(i) to analyse its market profile and the potential demand,

(ii) to investigate the product profile and its competitive advantage,

(iii) to segment the markets,

(iv) to evaluate the strengths, weaknesses, opportunities and threats of the target market segment,

(v) to recommend marketing strategy,

(vi) to study the financial viability of the investment, and

(vii) to evaluate the forms of direct investment.

It is very much hoped that this paper could provide the readers with a clear picture of the LPG investment viability in China and how it could be also competitive and profitable in the long run.

CHPATER III

SCOPE AND METHODOLOGY

The potential sites of building LPG depot are restricted to the four Special Economic Zones Xiamen, Shantou, Shenchun and Zhuhai because of their better investment environment and the growing consumers' needs for the improvement of living standard.

Shell Company has been treated as a potential investor of the LPG depot in these four coastal cities primarily because of the writer's association with the Company.

Secondary datas are collected from official statistics as the basis for the analysis.

The research will analyse local customers' perception towards imported LPG, price information in the market, competitors' activities and strategies, effective promotion methods and expenditures required and possible distribution network for downstream marketing.

Based on the information gathered, a market and strategic analysis will be performed with some methods suggested in the reference books : 'Competitive Strategy' and 'Competitive Advantage' written by Michael E. Porter.

Consequently, a time table will be included to tentatively outline the time frame for this project to be materialized.

CHPATER IV

GENERAL INFORMATION

The four municipalities under study share special characteristics in that each municipality has part of its area being classified as the Special Economic Zone in early 80s. In fact, these zones remain the only SEZs until Hainan is announced to be the 5th SEZ in late 80s.

Altogether, the four municipalities have an area of 13700 sq.km with a population of around 11.3 million at the year end 1990 (about 13 times bigger than Hong Kong and only 1.9 times more people).

After ten years economic reform and development, the economic structure of the three Special Economic Zones - Shantou, Shenchun and Zhuhai are shifting. The agricultural activities have gradually been replaced by other components such as industrial and construction. It could be noted that the percentage shares of agriculture output amongst the total society output are below the 19 cities' average in Guangdong.

Apparently, the development of Xiamen in Fujin Province has not been as rapid as those SEZs in Guangdong with the corresponding

outputs pretty in line with those average figures of the 19 cities mentioned above. More details could be referred to Appendix 1 which also includes a map showing the location of the four municipalities.

As a whole, Shenchun city shows an outstanding economic performance in that, in 1990, it is the 2nd most productive in terms of National Income and Total Society Output whereas the population ranks 12th amongst the 19 cities. Zhuhai and Shantou cities positioned 8th and 6th in economic statistics with population at 17th and 8th respectively. Thus it could be concluded that the per capita economic performance of these SEZs are all above average.

It is not surprising that the average income per capita in most of these SEZs are comparatively higher. In 1990, the monthly income per capita being :

Table 3

Per Capita Monthly Income

Cities	Per Capita Monthly Income (Yuan)
Xiamen	210.16
Shantou	* 150.09
Shenchun	319.23
Zhuhai	254.03
19 Cities' Average	196.24

* Due to historical and geographical reasons, large numbers of Shantou native people immigrated to foreign countries as early as in the 16th century. These people regularly send cash and daily necessity to their relatives in Shantou. The actual income should thus be greater than what is shown in the statistical publication.

The higher income has catalysed the switching of traditional fuel to higher cost LPG fuel in domestic sector, which coupled with 'considerable' growing demand of LPG called upon in the industrial sector stimuli the following section of market profile study.

CHAPTER V

MARKET PROFILE

Undoubtedly, the fast growing economy, high income level and the impact brought about by in-comers, either relatives or businessmen, to these frontier SEZs have facilitated the expectation of people towards a better life quality. As a result, the transformation of consuming gas fuel (LPG) as domestic energy from traditional solid fuel has developed rapidly in urban areas whereas great potential could be explored in the rural areas.

For the purpose of industrial use, LPG is still in an early development stage as liquid fuels are still the major source of energy supply :

(i) Industries in these four SEZs are in light industrial in nature such as food processing, handicrafts and electronics, paper making and textile. Most of them are still using cheaper liquid fuels in the production process and unlikely to switch to higher cost gas fuel, except those using heavily polluted solid fuel.

(ii) The existing equipments designed for liquid fuel are originally not for the purpose of using LPG. A change to LPG driven machines will probably not be in favour of the users unless new regulations of environmental protection can be introduced by Government.

(iii) Although some of the industries with foreign participation are using more efficient gas fuel such as McDonald in Shenchun, this sector has just taken off and leaves much room for further expansion.

(iv) Insufficient supply of good quality LPG has been becoming a factor that limits the market development, some investors have suspended their plans of setting up factories in the SEZs because of the insecure supply of LPG for their production.

However, with the Government's favourable policy for encouraging foreign investment and its growing attention to environmental protection, the potential demand for good quality LPG in the SEZs should not be underestimated.

Since the data of domestic consumption of LPG is more assessable than that of the industrial consumption, an estimate of domestic consumption based on the secondary sources have been made as the first step to ganging the industrial demand. The second stage is to calculate

the industrial demand as a percentage of the domestic demand. The estimated domestic and industrial demand for LPG are shown in Table 4.

Table 4

The Estimated Domestic and Industrial Demand for LPG in the Four Special Economic Zones

	LPG Demand (Ton)	1991	1995	2000	2005
Xiamen	**Domestic demand**	4771	7371	11987	18704
	Industrial demand	382	884	2038	4115
	Total demand	5153	8255	14024	22819
Shantou	**Domestic demand**	13439	26768	58598	124825
	Industrial demand	1075	3212	9962	27440
	Total demand	14515	29981	68560	152165
Shenchun	**Domestic demand**	20203	25309	33826	45867
	Industrial demand	1616	3037	5750	10091
	Total demand	21819	28346	39576	55958
Zhuhai	**Domestic demand**	13547	17271	22013	31623
	Industrial demand	1084	2073	3522	6957
	Total demand	14630	19344	27363	38580

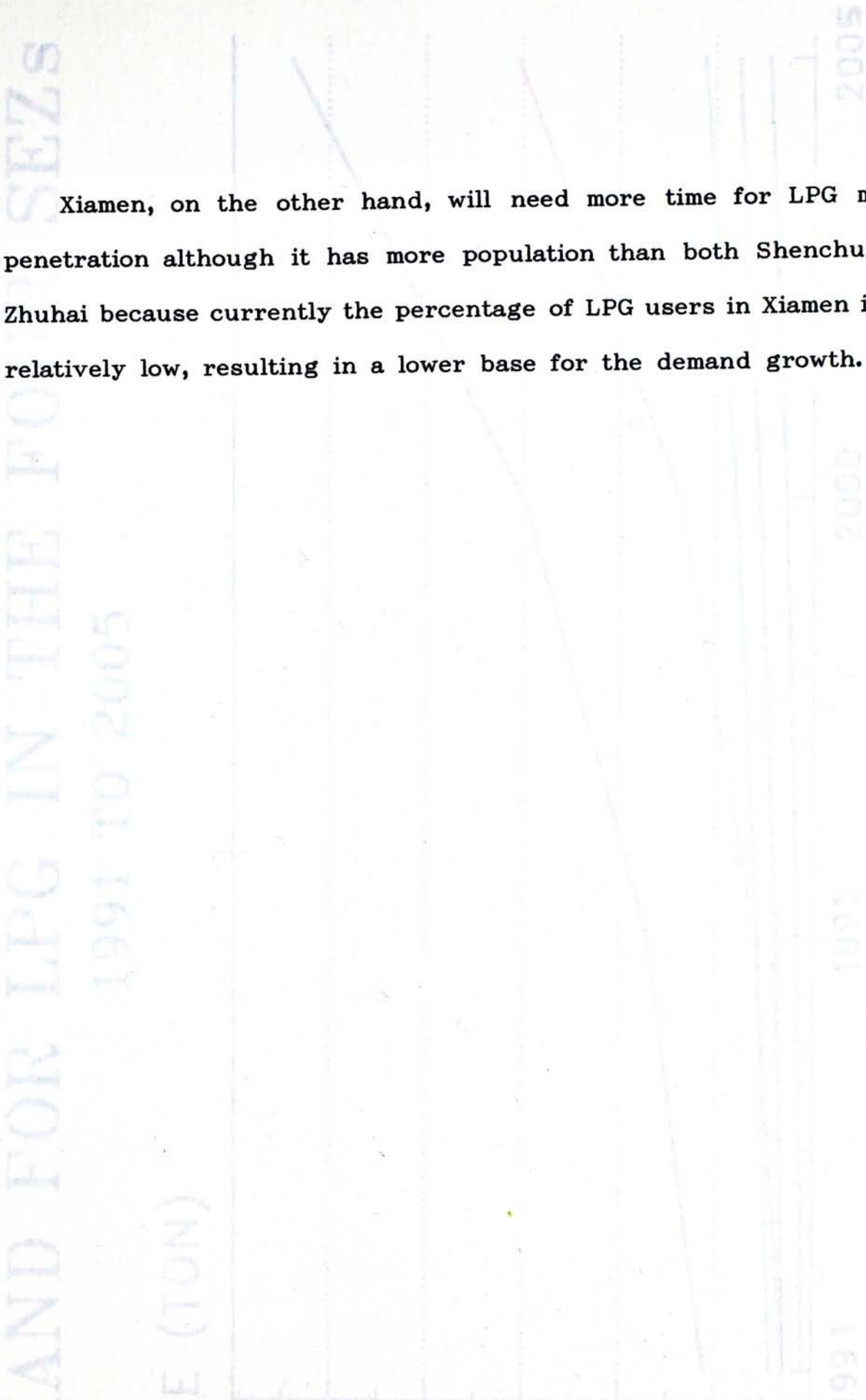
Total	**Domestic demand**	51960	76719	127798	220919
	Industrial demand	4157	9206	21726	48602
	Total demand	56117	85925	149524	269522
Percentage	**Domestic (%)**	92.6	89.3	85.5	82.0
	Industrial (%)	7.4	10.7	14.5	18.0

While the detail calculations are given in Appendix 2, a line graph showing the trend is attached in at the end of this chapter for reference. It should be highlighted that the projected demand for LPG in the coming decades for different SEZ depends very much on its population (particularly the city population where standard of living is higher), economic situation and the potential for LPG development.

Since Shantou has the greatest population among the four SEZs (nearly 8 times that of Xiamen and more than 10 times that of Shenchun and Zhuhai) and the living standard of people will be very compatible to any fast growing cities in southern China, the potential market for LPG is the greatest among the 4 SEZs.

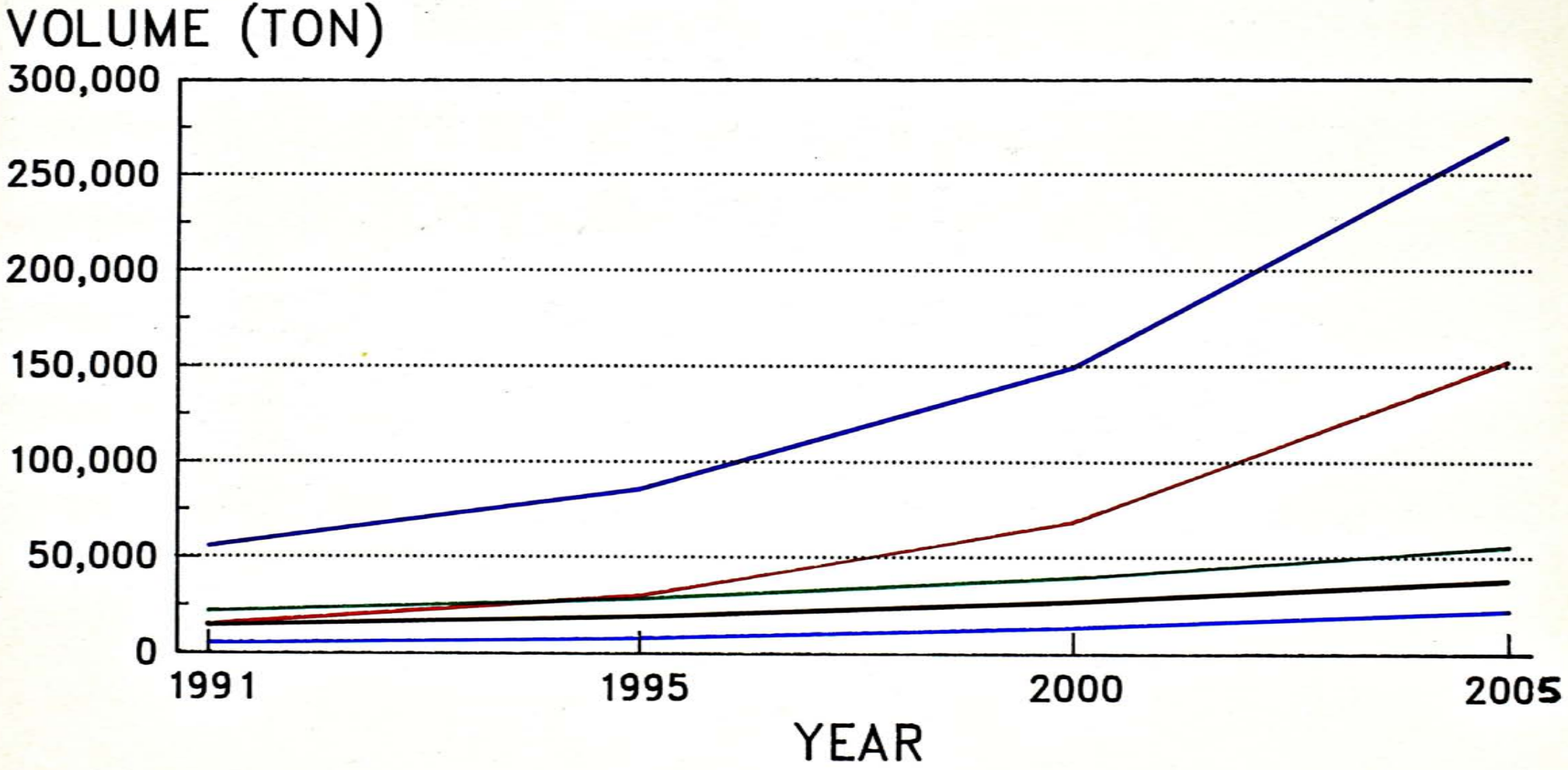
Although Shenchun has lesser population than Zhuhai as a whole, the city population of the former is greater than the latter. With similar economic situation and growth, the demand for LPG for Shenchun is still greater than Zhuhai.

Xiamen, on the other hand, will need more time for LPG market penetration although it has more population than both Shenchun and Zhuhai because currently the percentage of LPG users in Xiamen is still relatively low, resulting in a lower base for the demand growth.



DEMAND FOR LPG IN THE FOUR SEZs

1991 TO 2005



CHPATER VI

PRODUCT PROFILE

Physical Properties

Liquified Petroleum Gas is a mixture of propane and butane which are gaseous at normal ambient temperature but can be liquified under pressure to facilitate storage and handling. LPG serves as a clean fuel for cooking and heating in domestic and commercial markets and is also suitable for many uses in the industrial market where a higher quality fuel is required.

Being denser than air and colourless, it sinks invisibly if allowed to disperse in free air. As it is highly flammable and stored under high pressure in pressurised vessels, extreme care is needed to handle it to avoid accidents which could be disastrous.

Modes of Storage and Delivery

LPG is generally stored either in cylinders(bottles) or tanks and is available for consumption in different patterns. The former mainly aims at serving the lower consumption customers whereas the latter

for larger consumption commercial/industrial market. The development of tanks storage for centralised residential estates is expanding rapidly in highly congested cities such as Hong Kong.

For bottled LPG, customers only need to equip themselves with simple ancillary facilities : a pressure regulator to step down the pressure output from the cylinder and a section of tubings to carry LPG to the appliances. Whenever a bottle is consumed, a new one needs to substitute by disconnecting the regulator from the empty cylinder and connecting it to the new one. Customers will then return the empty bottle to retailer and carry back a filled one. Such method is simple but inconvenient should gas be suddenly used up without a spare new bottle of gas available.

For tank storage, a designated area called the storage compound, is allocated for the relatively larger sized fixed tanks. Fixed pipings are installed to carry LPG from the tank to the LPG consuming appliances/equipments. Regulator sets and ancillary facilities are installed in the storage compound. Bulk LPG vehicles will travel regularly to the compound to top up the tanks. Although initial capital investment is greater, this mode is considered more mordernised and could better guarantee a continuous supply of gas.

Importance of Quality

LPG is refined from crude oil, basically through traditional distillation process. The techniques in the whole process is of course critical to the quality of the output product. If uncleanly refined, some other oil products and sometimes even water (collectively known as heavy ends) could be found in the end-product.

For bottle customers, when the refined LPG is pressurized and stored in bottles, such heavy ends will also be pressed into them. When bottles are filled with the mixture of LPG and the impure substances up to the designated weight, the presence of such substances will invaribly reduce the actual quantity of LPG injected into the bottles. Now that bottle gas customers are paying for the gas at a unit weight basis, the heavy ends have thus reduced the marginal utility or in other words, increased the unit cost, for one unit of LPG purchased.

If tank gas customers are charged according to a gas meters installed at the outlet point of the gas compound, they could be better off as the heavy ends may have settled in the bottom of the tanks and probably only a smaller fraction could pass through the meters and billed. Yet the presence of such impure substance may, in the long run, pose adverse effect to the durability of the equipment and call for more frequent maintainence.

As such, the more advanced technology of refining LPG and the better quality control of imported gas in comparison to local produced LPG have resulted in the higher quality product, being welcomed by customers who are quality conscious and are prepared to pay a 'superficial' premium (which in fact will be compensated by saving those contaminated product's lower efficiency and higher maintainence cost) for it.

Package of Product

Due to the relatively scattered residential areas and the difficulties in arranging bulk vehicle delivery, LPG is mainly available in PRC in the form of bottles. In view of its highly flammable characteristics and the risk of explosion if exposed to intensive heat, the product should be sold in a package: with proper delivery service, regular safety inspection and emergency services provided. Although PRC customers are not quite care about this in the past, their changed attitude towards quality of life has called upon a different level of demand and that, at least, delivery of gas bottles is expected now.

As such, LPG retailers are now gradually involved in the service business which foreign players definitely secure the competitive advantage.

CHAPTER VII

COMPETITION PROFILE

According to Michael E. Porter, the state of competition in an industry depends on five basic competitive forces, namely : Potential Entrants, Substitutes, Suppliers, Buyers and Industry Competitors. A broad discussion will be carried out along this line, with the first two classified as external threat, the third and the forth directly relate to the vertical integration and the fifth one brings about competitive positioning.

Potential Entrance and Substitutes

LPG is mainly supplied by major oil marketers in the world, either locally from the Sinopec or externally from the Mobil, Esso of USA or from Shell of Dutch/England. The market structure of oligopoly that such oil marketers has been participating is controversial and is far too famous to explain here. Nevertheless, in this industry, the heavy asset and capital investment and the expertise required have created a great entry barrier to outsiders.

In particular to the market that this paper addresses, not all foreign oil marketers show their presence. It is probably due to the

different visions and thus strategies adopted to the China market. Apart from local suppliers, the main foreign LPG marketers in these areas are Shell and Esso. Thus, the potential entrants are clearly to be other international oil marketers, such as Mobil and Caltex who have present in the oil business in this far east region.

As far as substitutes are concerned, the direct substitutes are natural gas. It is claimed that a large natural gas basin has been discovered in the Yinggehai of the Hainan Province. The cost of further exploration, refinery and delivery are yet to be determined before it could be tapped to satisfy the gas fuel demand. Apart from that, there is no direct and readily available natural gas supply source nearby which can pose immediate threat to the LPG market in the whole Guangdong Province.

Indirect substitutes, such as other solid and liquid fuels, have been considered weak substitutes as the reverse trend is more likely to happen in the coming decades.

Suppliers and Buyers

Presently, the Company's LPG supplied to this region mainly comes from the Singapore refinery and the transit depot in Philippines. Unsurprisingly, the refinery, the transit depot and the Singapore operating company are also owned by the parent company. With steady

crude oil supply, the Company is virtually self-supplied with the required quality of product. Nevertheless, the quantity and the price are yet to be agreed and bid among other operating companies in the region. Of course, alternate supply via other oil companies is sometimes needed. Yet, the long term relationship established in ad-hoc or contracted arrangement as such has further secured the supply.

As explained earlier on, LPG customers mainly treasure the convenient and heat-efficient characteristics of LPG. They are willing to consume LPG provided that they can afford the price differential. Should the price difference be reasonable, there is little chance that customers will threaten to switch back to other fuel. As this market resembles that of the utilities business : heavy capital investment, necessity to exploit the economies of scale, etc, the possibility of buyer to consider backward integration is extremely slim. Moreover, the shortage of supply has strengthened the marketers' position in this region.

Industry Competitors

Basically, the competitors in this market sector are classified under two categories : the imported gas marketers and local gas suppliers.

Imported Gas Marketers

It is logically to note that the potential imported gas suppliers are mainly those players in the Hong Kong market. They are all those giant multinational oil companies who have representative offices in Hong Kong. Using these offices as bases, they could explore the potential of the untapped LPG market in the PRC and device their own strategies for penetration. Although trading is the lowest risk means of selling gas to the market, it must be pointed out that such one-off business transaction could not strengthen their representation in the market and could be vulnerable to vigourous price competition.

Among these companies, it has been noticed that different companies have different visions and business strategies in these areas. While some are extremely aggressive, like Shell, others show hardly any interest in it, such as Mobil. To provide background for analysing the competitive positioning of the Company in this market, their current positions in Hong Kong and their observed business direction in the PRC are tabulated below for comparison :

Table 5

Competitors Analysis

For LPG	Shell	Mobil	Esso	Caltex	Others
Co. registration	Du./Eng.	USA	USA	USA	N.A.
Est. market share in HK	35%	22%	15%	10%	18%
Market presence in PRC	High	Nil	Moderate	Low	Nil
Existing facilities in PRC	Yes, self invested	No	Yes, but rent	No	No
Distributor network	Growing	Nil	Some	Very few	Nil
Industrial customers	Some	Nil	Few	Very Few	Nil
Co.'s aggressiveness	High	Nil	Mod. high	Low	Nil
Mgt. commitment	Long term	Low	Short term	Short term	Nil

Product awareness in PRC	Medium	Nil	Medium	Low	Nil
Perceived image	Good	N.A.	Fine	Fine	N.A.
Perce. quality	Good	N.A.	Good	Good	N.A.
Promotion	Some	Nil	Little	Very few	Nil
Price HK$/kg	6.0	5.9	5.8	6.0	3.5 for local

Thus, focus must be placed on the increase of product awareness in the mainland and further quality improvement.

Obviously, Shell is the most aggressive foreign player in the market. With its market leading position and experience in Hong Kong, the establishment of a good distributor network which when coupled with localized gas depot facilities could definitely help its further penetrating into the market. They have the ambition to represent themselves a branded product in the market - again a premium product providing package of service to the end-users. There are two Joint Ventures oil depots that have been operating in PRC, selling the Company's branded product into the region.

Esso, apparently following the step of Shell, show short term commitment in that they rent gas facilities for their business. Their

customers are mostly wholesalers who source supply from virtually any suppliers, provided that price and supply logistic are acceptable to them. As such, loyalty of distributors is lacking and that their product when sold to such wholesalers, will not be marketed as branded product.

While Caltex only secure a few industrial customers in areas nearby Hong Kong and supplied directly from their Hong Kong depot facilities, Mobil has shown no interest in this particular segment although some representation of oil filling station and lubricants retail market in PRC. Unless their visions have tremendous change in the coming years which require strong management commitment and heavy capital investment, they could not impose any threat to the two more aggressive companies mentioned above.

Local Gas Suppliers

The word 'suppliers', particularly quoted here, highlights the fact that local gas firms merely satisfy the customers by supplying gas to them. In fact, quite a high percentage, if not all, of gas local distributors have the cylinders sold to their new customers who after the first purchase from such distributors could have their owned gas cylinders refilled virtually by any other distributors.

LPG are just sold like any other household commodities : customers take their own empty cylinders to the gas distributors who will arrange to have the empty cylinders refilled in their company's gas depot. The filled cylinders will then be transported back to the gas distributors' showroom and await collection of the cylinders back by their owners. This practice is of course not convenient and effective.

There is not much price difference among local gas distributors as usually the gas depot is run by local government, either county or municipal government, who will standardise the product price. No after sales service is warranted, although it has been pointed out that LPG cylinders call for careful handling and routine maintainence. In a word, there is no product differentiation. Companies who have supply could sell.

Listed in Appendix 3 is a list of those LPG produced refineries, southern to the Chengjiang and are those main local LPG supplier to our interested market. Their supply potential to the year 2005 is performed and a summary of the result, in a five year interval, is outlined below :

Table 6

Production Capacity of Selected Oil Refineries

PRODUCTION CAPACITY (KT)	1990	1995	2000	2005
Jinlin	76.3	108.7	150.0	150.0
Zhenhai	35.8	36.8	38.1	39.0
Jiujang	44.1	83.4	120.0	120.0
Fujian	-	23.7	23.7	23.7
Guangzhou	112.0	150.0	150.0	150.0

Note that the Fujian refinery only started production in 1991.

CHAPTER VIII

TARGET MARKETS

From what have been discussed in the above profiles, it is concluded that the depot facilities that we plan to invest should cater mainly for the following two market segments :

(i) for the domestic market, the higher income group who could afford the premium in return for quality and package of service.

(ii) for industrial sector, majority those foreign JV and some new local factories who need or are forced by law to use clean and efficient fuel for their production.

CHAPTER IX

SWOT ANALYSIS

Strengths

(i) A steady and high gas quality is guarantied which in fact is the reason that the Company managed to secure numerous industrial customers who set up production lines/business in PRC. For example, McDonald in Shenchun and Garden Bakery in Dongguan.

(ii) As the Company is well integrated, upwardly to crude oil exploration to refinery to downwardly to tanker for freight arrangement, a security source of supply can be achieved to bring about customers' confidence.

(iii) The strong management commitment to the PRC market facilitates resources acquiring and capital investment when and where appropriate.

(iv) Being well experienced in the gas business field, the Company has a very comprehensive business ethics, procedures

tailored for this market segment. Package of service in terms of delivery service, customer records keeping, routine safety check and emergency response could be introduced readily.

(v) The Company's branded LPG has been successfully penetrated a number of test spots with a perceived sound image of good quality and efficient gas fuel.

(vi) The product is positioned as a high end product in comparison to those local gas. This has a side effect as to satisfy the customers' self-esteemed desire. From the field research, it is noted that some customers actually stick small giveaways - stickers carrying the promotion slogan - to their doors in order to show that they are using premium gas. It is a status symbol to the end-users.

Weaknesses

(i) Price of imported gas is higher. This limits market penetration as average customers are rather price sensitive.

(ii) Currently, supply of cylinder gas is mainly from Hong Kong or from the Company's Joint Venture depot in Shekhou. Supply logistic is far from ideal, especially outside Shenchun,

like Shantou or Zhuhai where long transportation time and heavy costs are incurred. This further reduces the competitiveness in terms of product cost.

(iii) Unlike local gas company which are mostly government back, the establishment of business by foreign players in PRC requires time and good contacts to materialise.

(iv) The injection of capital investment for depot facilities is such a long term commitment that it could not be as flexible as renting facilities. Should business environment be unfavourable, it is rather difficult to pull out from the market.

(v) Equipments, such as cylinders, regulators are provided to customers in a deposit basis. Although cash return would not be a problem, the actual cost recovery from the cylinders (which is around RMB 170 each) will not be as good as selling cylinders to customers and vest the responsibility of upkeeping to them.

Opportunities

(i) The fast economic growth of the four Special Economic Zones will create a demand for energy in both industrial and residential segments.

(ii) The gradual economic reform from planning to market economy will narrow the price of local gas (which may originally be obtainable with so call an allocated price) and the imported gas, provided that the imported gas could further minimise their unit cost.

(iii) The improving living standard and thus higher expectation of life quality will induce the demand for a modernised means of cooking and water heating - LPG.

(iv) Environmental awareness, coupled with the high heating efficiency attained by burning LPG, will lead to a steady growth of LPG demand in industrial as well as commercial sectors.

(v) It will be noted from the later section that the projected demand will be greater than estimated supply to the four SEZs, resulting in shortage of LPG for imported gas penetration.

(vi) A better supply of foreign exchange would probably provide better opportunities for selling.

Threats/Limitations

(i) Economic structure in PRC is still in a reform stage. Although highly unlikely, there is still risk that planning economy will emulate whereby allocated price for basic necessity is resumed. In that circumstances, imported gas is totally non-competitive.

(ii) Domestic marketing of LPG is not a favourable trade in the PRC business context. State Council might not approve the business licence, either for the depot itself or even future distributors, especially when local supply is sufficient to be self-contented.

(iii) With the introduction of foreign technology/equipment and quality management to the refinery, the quality of local gas will be improving as years go by. The imported gas competitive advantage of better quality and higher heat efficient might vanish in the future.

(iv) In terms of depot construction, the Company's stringent requirement and standard might require imported materials and expertise which lead to a higher cost and thus longer period of return. The uncertainty and thus risk in relation to the business environment is considered relatively greater.

(v) Although not very active now, other foreign oil companies who have the base in Hong Kong, possess the potential to share the cake in the market.

CHAPTER X

MARKETING AND PROMOTION STRATEGIES

Efficiency in Heating

Apparently, the major weakness of imported gas in comparison to local gas is that imported gas is more expensive. However, when the gas quality is taken into account as discussed in the Section of **Importance of Quality**, the actual heat capacity that customers are paying for might not be the case.

A field experiment has been performed to compare the heating efficiency of the Company's gas and that of local gas : from each supply source, a new gas bottle is hooked up to a new gas cooker and a kettle of water is allowed to boil. Time needed for the water to reach the boiling state is recorded. With the identical model of gas cooker and that environmental change should be minimal as the two gas cookers are ignited simultaneously to start heating up the water, the result shows that the Company's gas needs 18 minutes to boil the kettle of water whereas it takes 25 minutes for the local gas to boil same volume of water.

In addition, customers who have used gas from both suppliers revealed that the average days per kg of the Company's gas is around 3.0 while that of local gas is only 2.2.

Hence from the above field experiment and the experience of utilisation, it could be concluded that the gas supplied by the Company is over 30% more efficient than the local gas.

Obviously, promotion emphasis should be placed on this point to publicize that the gas from the Company is not only sold as a package, but then the price is actually very competitive, if not cheaper.

Bottle Deposit System

From the field visit, it is noted that the suppliers of local gas will charge any new customers a non-refundable account opening fee of around RMB 1000, around HK$ 1400 (for two bottles of LPG, a two ring basic gas cooker and some ancillary equipment). All the equipment, including the bottles will be the customers' own property and that they will be liable for any damage or wear of such equipment.

It is proposed to adopt a more flexible, economical and responsible new account opening system for our potential customers : a deposit for the LPG bottle will be introduced and that customers are free to make their own choice over gas cooker models and number of gas bottles to deposit. Apart from the fact that customers could tailor

their own package according to their available budget and that they will have the bottle deposit back when they terminate their account in the future, it should be emphasised that those bottles remain as property of the Company and the Company is responsible for any upkeep and maintainence of the bottles. Customer could rest upon the supplier for a safe and well-functioned bottle for storing such highly flammable gas fuel in their premises.

The merit of the proposed system should put forward together with the message of the product awareness, importance of bottle upkeeping, the flexibilty and money back deposit concept - all gear for our end customers.

Product Differentiation

Since the Company has successfully stemmed its high quality and well received image in restricted areas where direct sales are being conducted, it should be along this line that the Company continues to position itself as a premium product : providing not only gas fuel to our customers, but also a package of service, security of supply which go along with the fulfilment of the self-actualisation needs that our target customers are looking for.

Thence, the Company should plan to :

(i) locate suitable sites for depot facilities investment. Only with sufficient storage capacity could customers' need be satisfied, both in normal days or in extraordinary periods when demand soars, like during Chinese New Year or typhoon season. In addition, an advance laboratory should be possessed in the depot to test all incoming product to guarantee a steady and high quality of supply.

(ii) establish a healthy distributor network in the sense that sufficient targetted area coverage should be catered for and yet no unhealthy competition will arise among distributors of the same Company. To this end, standard decoration and sales service (in terms of equipment pricing and billing procedures) should be introduced and upkept in the network to ensure that a consistent Company image is being projected.

(iii) provide emergency service and regular equipment safety inspection to our customers. Standard procedures and customer handbook are to be designed to arouse the confident of our customers in using our LPG and, at the same time, to boost the image of the Company.

(iv) recruit suitable resources, especially local employees, and have them properly trained and rewarded so that they are

motivated and are capable to provide excellent service to the end users. This, after all, is where the differentiation comes from - not only from the product itself but also how such product is sold via personal touch.

Contract with Industrial Customers

While the Section of **Bottle Deposit System** mainly addresses to our potential domestic end-users, the following strategy is suggested for future industrial customers.

Since our targetted industrial customers are mainly those foreign JV, these customers are comparatively less price elastic. In contrast, they treasure quality of gas, security of supply and also after sales service provided to help solving their equipment problem in relation to gas supply system. All such criterions fall exactly the same package of service that we have discussed in the above section of product differentiation. The mere question is how to secure a long term supply right with such large volume customers.

Trivially, the best way is to secure a supply contract with such customers. But in order to do so, the Company should provide sufficient confident to them and at the same time waive their concern of spending considerable amount of money in erecting the gas supply system. As far as these aspects are concerned, the Company should be prepared

to invest into the gas supply system which when coupled with the established image and a reasonable discount off the list price dependent upon the consumption level will facilitate the contract security with the targetted customers.

CHAPTER XI

REALIZABLE VOLUME AND FINANCIAL EVALUATION

With the market demand and local supply projections outlined in the Chapter of **MARKET PROFILE** and the Section of **Local Gas Suppliers** respectively, a shortage of supply is anticipated which allows great penetration potential for imported gas (see Appendix 4).

After analysing the competition profile and the Company's positioning and possible strategies adopted towards the targetted market segment, an estimated realizable volume that the Company could supply via its JV depot is projected. With the projected volume, the estimated level of investment (based on past experience over JV depots in the SEZ) and margins, a financial evaluation of such capital investment is conducted to see its viability.

While detail calculation could be found in Appendix 4 for volume projection, the following table summarizes the result :

Table 7

Realizable Volume for Potential Supply

VOLUME IN TONS	1995	2000	2005
Total demand of 4 SEZs	85925	149524	269522
Estimated local supply to the 4 SEZs	43500	52000	52100
Deduced shortage of supply	42425	97524	217422
Potential supply by the company and its JVs	6364	29257	65226

With the above volume projected, a financial evaluation is performed to judge that for an estimated capital investment, whether such long term project would be viable. The detail calculation is listed in Appendix 5, the table below provide an insight as to the financial justification.

Table 8

Summary for Financial Evaluation

Estimated capital investment (96 money) (HK$ M)	200
Net present value (95 money) (HK$ M)	93
Earning power post tax (%)	17.89
Payback (years)	7

CHAPTER XII

CONCLUSION AND RECOMMENDATION

From the above evaluation, it seems that the project could be considered viable as an earning power of nearly 18% is noted, which is relatively high as far as such a long term and yet with low risk investment is concerned.

However when the performance is judged by the net present value, the fact that a return of only HK$93 million is resulted for a capital investment of HK$200 million appears not attractive enough. Furthermore it requires 7 years to payback.

Although the above argument could be controversial, the project is still considered viable and strategically worth-investing since :

(i) in the financial evaluation, a project life period of 10 years after the depot operates is assumed which is in fact quite conservative as it is not uncommon that LPG facilities could last more than 15 years. Of course, certain major upgra-

ding/overhauling is warranted after 10 years from operation. In any case, better result in the NPV is expected if the project could extend beyond 10 years.

(ii) having already set up some dealers in the market, experience reflected that the Company has secured a high degree of recognition in the market. Should no support is given to the dealers by providing them with security supply source from self owned depot in the region, there is limited expansion in their business and thus an adverse effect over their loyalty could occur. If this is coupled by a more aggressive attitude of the competitors to invest in depot facilities in the area who could guarantee supply, there is a strong threat that the dealers will switch to the competitor.

(iii) currently, some industrial customers in Hong Kong are considering moving/expanding their business into the SEZs of China. With the established relationship between the Company and such customers, there is no reason why we could not serve them in China. Only that a depot is to be established to minimise our operating cost and at the same time, guarantee them with supply security.

As a result, the project should be brought into materialisation. Yet the following points are recommended for further consideration :

(i) with a highest demand in Shantou, it is recommended that opportunities should first be explored in this municipality to secure a foothold in this market. Following which could be Zhuhai as the area is in the rich Pearl Delta where people are quite wealthy to afford burning LPG. Shenchun could then be developed as the Company has already participated in a joint venture LPG depot in Shekhou and that some major customers could also be supplied via Hong Kong. Xiamen, being most remote from Hong Kong and requiring much more skill to tackle with the locals as they tend to form a social cycle of their own and that the demand is relatively smaller, could be considered later.

(ii) in the course of study, forex balancing is always a question to ask and tackle. With considerable numbers of foreign JVs in the SEZs, the chance of securing such customers who possess foreign currency is higher and others with import substitution licence could also be the targetted customers for foreign currencies.

(iii) in terms of RMB deflation, it is always a good suggestion to keep minimum amount of RMB and hard currency is always preferred. As such, a good local JV partner who can arrange forex and is willing to assure foreign currency to the Company, is essential. It is the reason that our dealer, who is a local

businessman, is one of the ideal partner. While he should be familiar with local forex condition and that he requires RMB for most of its operation, forex arranged through him is much easier. In this case, the responsibility of such a partner should be spelt out in the JV agreement.

(iv) to enjoy the tax benefits, the project should be considered as one in the SEZs. Local government's attitude is very essential and should be investigated right from the beginning of the feasibility study.

Afterall, materialization of the project, of course, depend upon detail study and the following time table is suggested to conclude the study :

Table 9

Tentative Program for LPG Depot Construction

	Shantou	Zhuhai	Shenchun	Xiamen
Project scouting	Q2/92	Q2/92	Q3/92	Q4/92
Pre-feasibility study	Q3/92	Q3-Q4/92	Q4/92	Q1/93
Feasibility study	Q4/92	Q1/93	Q2/93	Q3/93
Approval security	Q1/93	Q2/93	Q3/93	Q4/93
Detail design	Q2/93	Q3/93	Q4/93	Q1/94
Construction	Q3/93	Q4/93	Q1/94	Q2/94
Completion and operation	Q4/94	Q2/95	Q3/95	Q4/95

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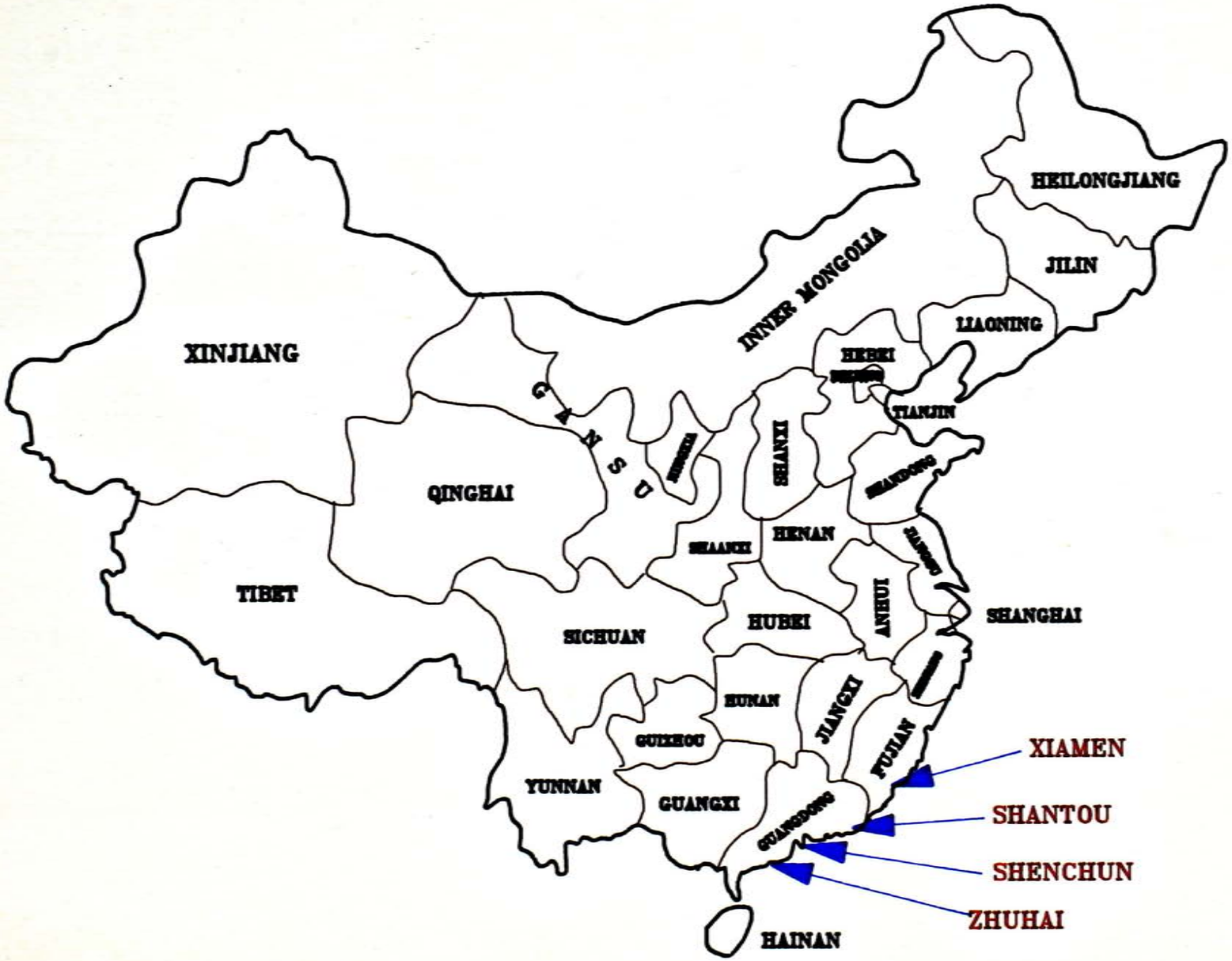
LOCATION OF THE FOUR SEZs UNDER STUDY



ECONOMIC SITUATION OF CITIES OF XIAMEN, SHANTOU, SHENCHUN AND ZHUHAI c.f. TOTAL GUANGDONG'S 19 CITIES

APPENDIX 1

(0'000 RMB at CURRENT PRICE)

IN 1990	TOTAL 19 CITIES		XIEMAN		SHANTOU		SHENCHUN		ZHUHAI	
TOTAL SOCIETY PRODUCT	16644860	(%)	1126275	(%)	828269	(%)	2312775	(%)	662676	(%)
AGRICULTURE	1261685	7.58	97776	8.68	30970	3.74	12703	0.55	49808	7.52
INDUSTRIAL	11476888	68.95	786874	69.87	582453	70.32	1647129	71.22	455997	68.81
CONSTRUCTION	1565687	9.41	107490	9.54	106981	12.92	394014	17.04	79552	12.00
TRANSPORT	921060	5.53	32519	2.89	40410	4.88	69792	3.02	20507	3.09
COMMERCIAL	1420540	8.53	101616	9.02	67455	8.14	189137	8.18	56812	8.57

LPG DEMAND PROJECTION (1991 - 2005)

APPENDIX 2

			1988	1989	1990	A.A.I.	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
XIAMEN																					
DOM. :	MUNICIPAL POPULATION	(0'000)		109.28	111.86	2.31	114.44	117.09	119.79	122.56	125.39	128.29	131.25	134.28	137.38	140.56	143.80	147.13	150.53	154.00	157.56
	CITY POPULATION	(0'000)		58.98	60.31	2.20	61.64	62.99	64.38	65.80	67.24	68.72	70.23	71.78	73.36	74.97	76.62	78.31	80.03	81.79	83.59
	HOUSEHOLD SIZE				3.84	-1.22	3.79	3.75	3.70	3.66	3.61	3.57	3.52	3.48	3.44	3.40	3.36	3.31	3.27	3.23	3.20
	NO. OF FAMILY	(0'000)			15.71		16.25	16.82	17.40	18.00	18.62	19.26	19.93	20.62	21.33	22.07	22.83	23.62	24.44	25.28	26.16
	AVG. MON. LIVING INC./CAPITA (MOD)	(RMB)		168.63	195.42	15.89	226.47	262.44	304.14	352.46	408.45	473.34	548.54	635.69	736.68	853.71	989.34	1146.51	1328.66	1539.74	1784.36
	PER CAPITA (RT)	(RMB)					226.47	238.59	251.35	264.81	278.98	293.91	309.64	326.21	343.66	362.06	381.43	401.85	423.35	446.01	469.88
	PER FAMILY (RT)	(RMB)			750		858.83	893.79	930.18	968.05	1007.46	1048.47	1091.16	1135.58	1181.81	1229.93	1280.00	1332.11	1386.34	1442.78	1501.52
	1990 AVG. LPG PURCHASED PER CAPITA	(KG)			26.83	1.41	28.24	29.65	31.06	32.48	33.89	35.30	36.71	38.12	39.53	40.94	42.35	43.77	45.18	46.59	48.00
	PER FAMILY	(KG)			103		107	111	115	119	122	126	129	133	136	139	142	145	148	151	153
	% OF HOUSEHOLD USING LPG	(%)			24		25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
	LPG DEMAND IN CITY	(TONS)					4352	4857	5400	5983	6608	7277	7993	8756	9570	10437	11358	12338	13377	14480	15648
	OUTSIDE CITY POPULATION	(0'000)		50.29	51.55		52.81	54.09	55.41	56.76	58.15	59.57	61.02	62.50	64.03	65.59	67.18	68.82	70.50	72.21	73.97
	NO. OF FAMILY	(0'000)					9	10	10	11	11	11	12	12	13	13	14	14	15	15	16
	LPG DEMAND OUTSIDE CITY	(TONS)					419	489	568	659	763	882	1017	1172	1349	1550	1779	2040	2336	2673	3056
	TOTAL MUNICIPAL LPG DEMAND	(TONS)					4771	5345	5968	6642	7371	8159	9010	9928	10919	11987	13138	14378	15714	17153	18704
	% OF TOTAL	(%)					92.59	91.74	90.91	90.09	89.29	88.50	87.72	86.96	86.21	85.47	84.75	84.03	83.33	82.64	81.97
IND. :	DEDUCED DEMAND AS A % OF DOMESTIC	(TONS)					382	481	597	731	884	1061	1261	1489	1747	2038	2365	2732	3143	3602	4115
	% OF TOTAL	(%)					7.41	8.26	9.09	9.91	10.71	11.50	12.28	13.04	13.79	14.53	15.25	15.97	16.67	17.36	18.03
TOTAL :		(TONS)					5153	5826	6564	7372	8255	9219	10271	11417	12666	14024	15502	17109	18857	20755	22819
SHANTOU																					
DOM. :	MUNICIPAL POPULATION	(0'000)	800	835.51	897	5.89	949.83	1005.76	1064.99	1127.71	1194.12	1264.44	1338.91	1417.76	1501.25	1589.66	1683.28	1782.41	1887.38	1998.53	2116.22
	CITY POPULATION	(0'000)	80.11	81.44	85.64	3.39	88.55	91.55	94.66	97.87	101.19	104.63	108.18	111.85	115.65	119.57	123.63	127.83	132.16	136.65	141.29
	HOUSEHOLD SIZE		4.19	4.11	3.89	-1.22	3.84	3.80	3.75	3.70	3.66	3.61	3.57	3.53	3.48	3.44	3.40	3.36	3.32	3.28	3.24
	NO. OF FAMILY	(0'000)	19.12	19.82	22.02		23.04	24.12	25.24	26.42	27.65	28.94	30.29	31.71	33.19	34.74	36.36	38.05	39.83	41.69	43.63
	AVG. MON. LIVING INC./CAPITA (MOD)	(RMB)	100.89	139.35	150.09	21.97	183.06	223.28	272.34	332.17	405.15	494.15	602.72	735.13	896.64	1093.63	1333.90	1626.95	1984.38	2420.34	2952.09
	PER CAPITA (RT)	(RMB)					183.06	202.98	225.07	249.56	276.72	306.83	340.22	377.24	418.29	463.81	514.27	570.24	632.29	701.09	777.38
	PER FAMILY (RT)	(RMB)			584		703.46	770.53	843.99	924.46	1012.59	1109.13	1214.87	1330.69	1457.56	1596.52	1748.73	1915.45	2098.06	2298.09	2517.18
	1990 AVG. LPG PURCHASED PER CAPITA	(KG)			18.05	2.00	20.05	22.04	24.04	26.04	28.03	30.03	32.03	34.02	36.02	38.02	40.01	42.01	44.01	46.00	48.00
	PER FAMILY	(KG)			70		77	84	90	96	103	109	114	120	126	131	136	141	146	151	155
	% OF HOUSEHOLD USING LPG	(%)			47		48	49	50	51	52	53	54	55	56	57	58	59	60	61	62
	LPG DEMAND IN CITY	(TONS)					8520	9889	11378	12996	14751	16652	18709	20930	23327	25910	28692	31683	34896	38346	42047
	OUTSIDE CITY POPULATION	(0'000)	719.89	754.07	811.36		861.28	914.21	970.33	1029.84	1092.93	1159.82	1230.73	1305.91	1385.61	1470.09	1559.65	1654.58	1755.21	1861.88	1974.93
	NO. OF FAMILY	(0'000)					154	166	178	192	206	222	238	256	275	296	318	342	367	394	424
	LPG DEMAND OUTSIDE CITY	(TONS)					4919	6219	7798	9709	12017	14797	18139	22148	26949	32688	39537	47700	57416	68966	82678
	TOTAL MUNICIPAL LPG DEMAND	(TONS)					13439	16108	19176	22705	26768	31450	36848	43079	50276	58598	68229	79383	92313	107312	124725
	% OF TOTAL	(%)					92.59	91.74	90.91	90.09	89.29	88.50	87.72	86.96	86.21	85.47	84.75	84.03	83.33	82.64	81.97
IND. :	DEDUCED DEMAND AS A % OF DOMESTIC	(TONS)					1075	1450	1918	2498	3212	4088	5159	6462	8044	9962	12281	15083	18463	22536	27440
	% OF TOTAL	(%)					7.41	8.26	9.09	9.91	10.71	11.50	12.28	13.04	13.79	14.53	15.25	15.97	16.67	17.36	18.03

TOTAL :		(TONS)					14515	17558	21093	25203	29981	35538	42007	49541	58320	68560	80510	94466	110775	129848	152165
SHENCHUN																					
DOM. :	MUNICIPAL POPULATION	(0'000)	60.14	64.82	68.65	6.84	73.35	78.36	83.73	89.45	95.57	102.11	109.10	116.56	124.53	133.05	142.16	151.88	162.27	173.37	185.23
	CITY POPULATION	(0'000)	32.19	36.2	39.53	10.82	41.67	43.92	46.30	48.80	51.44	54.22	57.15	60.24	63.50	66.94	70.56	74.37	78.39	82.63	87.10
	HOUSEHOLD SIZE		3.9	3.93	3.81	-1.16	3.77	3.72	3.68	3.64	3.59	3.55	3.51	3.47	3.43	3.39	3.35	3.31	3.27	3.24	3.20
	NO. OF FAMILY	(0'000)	8.25	9.21	10.38		11.06	11.80	12.58	13.42	14.31	15.26	16.28	17.36	18.51	19.74	21.06	22.46	23.95	25.54	27.24
	AVG. MON. LIVING INC./CAPITA (MOD)	(RMB)	198.56	286.17	319.23	26.80	404.77	513.23	650.76	825.14	1046.25	1326.60	1682.08	2132.81	2704.32	3428.97	4347.80	5512.84	6990.07	8863.13	11238.11
	PER CAPITA (RT)	(RMB)					404.77	466.58	537.82	619.94	714.60	823.71	949.49	1094.47	1261.58	1454.22	1676.26	1932.22	2227.25	2567.33	2959.35
	PER FAMILY (RT)	(RMB)			1216		1524.28	1736.63	1978.57	2254.21	2568.26	2926.05	3333.69	3798.12	4327.26	4930.10	5616.94	6399.45	7290.99	8306.73	9463.97
	1990 AVG. LPG PURCHASED PER CAPITA	(KG)			47.44	0.04	47.48	47.51	47.55	47.59	47.63	47.66	47.70	47.74	47.78	47.81	47.85	47.89	47.93	47.96	48.00
	PER FAMILY	(KG)			181		179	177	175	173	171	169	167	166	164	162	160	159	157	155	154
	% OF HOUSEHOLD USING LPG	(%)			100		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	LPG DEMAND IN CITY	(TONS)					19783	20869	22015	23224	24499	25844	27263	28760	30339	32005	33762	35616	37571	39634	41810
	OUTSIDE CITY POPULATION	(0'000)	27.95	28.62	29.12		31.68	34.44	37.43	40.65	44.13	47.89	51.94	56.32	61.03	66.12	71.60	77.51	83.88	90.74	98.13
	NO. OF FAMILY	(0'000)					6	6	7	8	8	9	10	11	12	13	15	16	18	19	21
	LPG DEMAND OUTSIDE CITY	(TONS)					420	495	584	688	810	953	1121	1318	1550	1821	2139	2511	2948	3459	4057
	TOTAL MUNICIPAL LPG DEMAND	(TONS)					20203	21364	22599	23911	25309	26797	28384	30078	31889	33826	35901	38127	40519	43093	45867
	% OF TOTAL	(%)					92.59	91.74	90.91	90.09	89.29	88.50	87.72	86.96	86.21	85.47	84.75	84.03	83.33	82.64	81.97
IND. :	DEDUCED DEMAND AS A % OF DOMESTIC	(TONS)					1616	1923	2260	2630	3037	3484	3974	4512	5102	5750	6462	7244	8104	9049	10091
	% OF TOTAL	(%)					7.41	8.26	9.09	9.91	10.71	11.50	12.28	13.04	13.79	14.53	15.25	15.97	16.67	17.36	18.03
TOTAL :		(TONS)					21819	23287	24858	26542	28346	30281	32358	34590	36991	39576	42363	45371	48622	52142	55958
ZHUHAI																					
DOM. :	MUNICIPAL POPULATION	(0'000)	46.6	48.63	50.25	3.84	52.18	54.19	56.27	58.43	60.68	63.01	65.43	67.94	70.55	73.26	76.08	79.00	82.04	85.19	88.46
	CITY POPULATION	(0'000)	19.07	21.6	26.57	18.04	28.17	29.86	31.66	33.56	35.58	37.72	39.98	42.39	44.94	47.64	50.50	53.54	56.76	60.17	63.79
	HOUSEHOLD SIZE				3.75	-1.16	3.71	3.66	3.62	3.58	3.54	3.50	3.46	3.42	3.38	3.34	3.30	3.26	3.22	3.18	3.15
	NO. OF FAMILY	(0'000)			7.09		7.60	8.15	8.74	9.38	10.06	10.79	11.57	12.41	13.31	14.28	15.31	16.42	17.62	18.89	20.27
	AVG. MON. LIVING INC./CAPITA (MOD)	(RMB)			254.03	26.80	322.10	408.41	517.85	656.61	832.56	1055.65	1338.53	1697.20	2151.98	2728.63	3459.80	4386.89	5562.40	7052.91	8942.82
	PER CAPITA (RT)	(RMB)					322.10	371.28	427.97	493.32	568.65	655.48	755.56	870.93	1003.92	1157.21	1333.90	1537.58	1772.35	2042.98	2354.92
	PER FAMILY (RT)	(RMB)			953		1193.86	1360.18	1549.67	1765.56	2011.53	2291.76	2611.04	2974.79	3389.22	3861.39	4399.34	5012.22	5710.50	6506.05	7412.44
	1990 AVG. LPG PURCHASED PER CAPITA	(KG)			46.92	0.07	46.99	47.06	47.14	47.21	47.28	47.35	47.42	47.50	47.57	47.64	47.71	47.78	47.86	47.93	48.00
	PER FAMILY	(KG)			176		174	172	171	169	167	166	164	162	161	159	157	156	154	153	151
	% OF HOUSEHOLD USING LPG	(%)			100		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	LPG DEMAND IN CITY	(TONS)					13236	14054	14922	15843	16821	17860	18962	20133	21376	22695	24096	25584	27163	28839	30619
	OUTSIDE CITY POPULATION	(0'000)	27.53	27.03	23.68		24.01	24.32	24.61	24.87	25.10	25.29	25.44	25.55	25.62	25.62	25.58	25.46	25.28	25.02	24.67
	NO. OF FAMILY	(0'000)					4	4	5	5	5	5	5	5	5	5	5	5	5	5	5
	LPG DEMAND OUTSIDE CITY	(TONS)					310	341	374	411	450	492	537	586	637	692	750	810	873	938	1004
	TOTAL MUNICIPAL LPG DEMAND	(TONS)					13547	14395	15296	16254	17271	18352	19500	20719	22013	23387	24846	26394	28036	29777	31623
	% OF TOTAL	(%)					92.59	91.74	90.91	90.09	89.29	88.50	87.72	86.96	86.21	85.47	84.75	84.03	83.33	82.64	81.97
IND. :	DEDUCED DEMAND AS A % OF DOMESTIC	(TONS)					1084	1296	1530	1788	2073	2386	2730	3108	3522	3976	4472	5015	5607	6253	6957
	% OF TOTAL	(%)					7.41	8.26	9.09	9.91	10.71	11.50	12.28	13.04	13.79	14.53	15.25	15.97	16.67	17.36	18.03
TOTAL :		(TONS)					14630	15690	16826	18042	19344	20737	22230	23827	25535	27363	29318	31409	33643	36030	38580
GRAND TOTAL OF THE 4 MUNICIPALITIES :																					

DOM. :		(TONS)	51960	57212	63038	69512	76719	84757	93742	103804	115097	127798	142113	158281	176581	197335	220919		
	% OF TOTAL	(%)	92.59	91.74	90.91	90.09	89.29	88.50	87.72	86.96	86.21	85.47	84.75	84.03	83.33	82.64	81.97		
IND. :		(TONS)	4157	5149	6304	7646	9206	11018	13124	15571	18416	21726	25580	30073	35316	41440	48602		
	% OF TOTAL	(%)	7.41	8.26	9.09	9.91	10.71	11.50	12.28	13.04	13.79	14.53	15.25	15.97	16.67	17.36	18.03		
TOTAL :		(TONS)	56117	62361	69342	77158	85925	95776	106866	119375	133512	149524	167693	188355	211897	238775	269522		

REMARK : 1. APART FROM XIAMEN, 1988, 1989 AND 1990 DATAS ARE SOURCED FROM THE GUANGDONG STATISTICAL YEARBOOKS 1989, 1990 AND 1991 RESPECTIVELY
2. XIAMEN DATAS ARE OBTAINED FROM THE XIAMEN SEZ YEARBOOK, WITH HOUSEHOLD INCREASING RATE ASSUMED TO BE THE SAME AS SHANTOU
3. SHENCHUN AND ZHUHAI CITY POPULATION GROWTH RATES HAVE BEEN REDUCED BY 50% AND 66.7% RESPECTIVELY TO REFLECT A MORE REASONABLE PROJECTION
4. DUE TO LACK OF INFORMATION REGARDING ZHUHAI'S HOUSEHOLD SIZE AND INCOME HISTORY, THEIR CORRESPONDING GROWTH RATES ARE REFERRED TO THOSE OF SHENCHUN WHICH SHARES SIMILAR CHARACTERISTICS
5. SHANTOU FAMILY DECREASING RATE IS REDUCED BY 33% TO OBTAIN MORE REASONABLE HOUSEHOLD SIZE OF AROUND 3 IN LATER YEARS
6. DEFLATION BASED ON 10% AS ASSUMED IN COMPANY'S PLAN FOR PRC CPI
7. EACH CAPITA WILL REACH CONSUMPTION LEVEL OF 48KG ANNUALLY AT THE YEAR 2005 AS THAT OF CURRENT HK FIGURE
8. HOUSEHOLD SIZE OUTSIDE CITY BASED ON PROJECTION GIVEN BELOW, BY HALVING THE A.A.I. OF THE DECLINING RATE IN ORDER TO BE MORE REASONABLE
9. ONLY THOSE OF THE HIGHEST INCOME GROUP COULD AFFORD CONSUMING LPG, 66.7% OF THE A.A.I. IS USED TO PROJECT THE SIZE OF THIS GROUP
10. FOR THOSE OUTSIDE CITY, AVERAGE LPG CONSUMPTION PER FAMILY IS ASSUMED TO BE 60% OF THOSE IN CITY
11. INDUSTRIAL DEMAND ARE ASSUMED TO BE 8% OF THE TOTAL DOMESTIC DEMAND IN THE YEAR 1991 AND INCREASE BY 1% PER ANNUM (i.e. 22% AT THE YEAR 2005 WHICH IS STILL LOWER THAN HK CURRENT 30% THUS A CONSERVATIVE FIGURE IS ASSUMED)

GUANGDONG			1988	1989	1990	A.A.I.	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
	ANNUAL VILLAGE INC./CAPITA DIST.	SAMPLE SIZE	2640	2660	2560																
	BELOW 300 RMB		98	34	72																
	300-600 RMB		940	604	562																
	600-1000 RMB		957	1088	995																
	1000-1500 RMB		389	568	555																
	1500-2000 RMB		148	194	213																
	ABOVE 2000 RMB		108	172	163																
	(% DIST.)																				
	BELOW 300 RMB		3.71	1.28	2.81																
	300-600 RMB		35.61	22.71	21.95																
	600-1000 RMB		36.25	40.90	38.87																
	1000-1500 RMB		14.73	21.35	21.68																
	1500-2000 RMB		5.61	7.29	8.32																
	ABOVE 2000 RMB		4.09	6.47	6.37	24.76	6.89	7.46	8.08	8.74	9.47	10.25	11.09	12.01	13.00	14.07	15.23	16.49	17.85	19.32	20.92
	HOUSEHOLD SIZE		5.95	5.69	5.65	-2.55	5.58	5.51	5.44	5.37	5.30	5.23	5.16	5.10	5.03	4.97	4.91	4.84	4.78	4.72	4.66
DEFLATION	ASSUMED TO BE 10% PER YEAR						1	0.91	0.83	0.75	0.68	0.62	0.56	0.51	0.47	0.42	0.39	0.35	0.32	0.29	0.26

LOCAL LPG SUPPLIERS IN THE REGION - SOUTHERN OF CHENGJIANG

APPENDIX 3

	ACTUAL LPG PRODUCTIVITY (K TON)					A.A.I.	PROJECTED LPG PRODUCTIVITY (K TON)														DESIGN CAPACITY (K TON)
	1986	1987	1988	1989	1990		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	
JINLIN	57.5	67.7	92.3	87.5	76.3	7.33	81.9	87.9	94.3	101.2	108.7	116.6	125.2	134.4	144.2	150.0	150.0	150.0	150.0	150.0	150.0	150
ZHENHAI	35.0	37.2	28.8	35.2	35.8	0.57	36.0	36.2	36.4	36.6	36.8	37.0	37.2	37.5	37.7	37.9	38.1	38.3	38.5	38.7	39.0	100
JIUJANG	26.5	36.7	43.3	43.8	44.1	13.58	50.1	56.9	64.6	73.4	83.4	94.7	107.5	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120
FUJIAN							23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7
GUANGZHOU	67.0	68.9	64.3	81.4	112.0	13.71	127.4	144.8	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150
TOTAL	186.0	210.5	228.7	247.9	268.2		319.0	349.5	369.1	385.0	402.5	422.0	443.7	465.5	475.6	481.6	481.8	482.0	482.2	482.4	482.7	543.7

PROJECTED LPG SUPPLIED TO THE FOUR MUNICIPALITIES (K TON)

1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
34.5	37.7	39.9	41.6	43.5	45.6	47.9	50.3	51.4	52.0	52.0	52.1	52.1	52.1	52.1

REMARKS :1. ACTUAL FIGURES SOURCED FROM 'SINOPEC ANNUAL REPORT 1991'
2. PROJECTION IS CARRIED OUT AT AN INCREASING RATE EQUAL TO THE A.A.I. BETWEEN 1986 TO 1990 UNTIL THE DESIGN CAPACITY IS REACHED
3. FUJIAN REFINERY JUST STARTS OPERATION AND THE PRODUCTIVITY IS IN FACT THE DESIGNED CAPACITY
4. THE FOUR MUNICIPALITIES HAVE A TOTAL POPULTION OF 11.3 MILLION (I.E. 3.6% OF THE POPULATION SOUTHERN TO CHENGJIANG)
5. LPG SUPPLY TO THE FOUR MUNICIPALITIES IS ASSUMED TO BE WITH A % TRIBLE THAT OF THE POPULATION % DUE TO THE FASTER GROWTH OF THESE AREAS

POPULATION SOUTHERN TO CHENGJIANG (MILLION)

	1989
SHANGHAI	12.76
ZHEJIANG	42.08
FUIJIAN	28.96
JIANGXI	36.95
HUNNAN	60.09
GUANGDONG	60.25
GUANGXI	41.51
GUIZHOU	31.69
TOTAL	314.29

SOURCE : CHINA STATISTICAL YEARBOOK 1990

LPG DEMAND AND LOCAL SUPPLY TO THE REGION

APPENDIX 4

			1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
DEMAND																	
XIAMEN																	
DOM. :	TOTAL MUNICIPAL LPG DEMAND	(TONS)	4771	5345	5968	6642	7371	8159	9010	9928	10919	11987	13138	14378	15714	17153	18704
IND. :	DEDUCED DEMAND AS A % OF DOMESTIC	(TONS)	382	481	597	731	884	1061	1261	1489	1747	2038	2365	2732	3143	3602	4115
TOTAL :		(TONS)	5153	5826	6564	7372	8255	9219	10271	11417	12666	14024	15502	17109	18857	20755	22819
SHANTOU																	
DOM. :	TOTAL MUNICIPAL LPG DEMAND	(TONS)	13439	16108	19176	22705	26768	31450	36848	43079	50276	58598	68229	79383	92313	107312	124725
IND. :	DEDUCED DEMAND AS A % OF DOMESTIC	(TONS)	1075	1450	1918	2498	3212	4088	5159	6462	8044	9962	12281	15083	18463	22536	27440
TOTAL :		(TONS)	14515	17558	21093	25203	29981	35538	42007	49541	58320	68560	80510	94466	110775	129848	152165
SHENCHUN																	
DOM. :	TOTAL MUNICIPAL LPG DEMAND	(TONS)	20203	21364	22599	23911	25309	26797	28384	30078	31889	33826	35901	38127	40519	43093	45867
IND. :	DEDUCED DEMAND AS A % OF DOMESTIC	(TONS)	1616	1923	2260	2630	3037	3484	3974	4512	5102	5750	6462	7244	8104	9049	10091
TOTAL :		(TONS)	21819	23287	24858	26542	28346	30281	32358	34590	36991	39576	42363	45371	48622	52142	55958
ZHUHAI																	
DOM. :	TOTAL MUNICIPAL LPG DEMAND	(TONS)	13547	14395	15296	16254	17271	18352	19500	20719	22013	23387	24846	26394	28036	29777	31623
IND. :	DEDUCED DEMAND AS A % OF DOMESTIC	(TONS)	1084	1296	1530	1788	2073	2386	2730	3108	3522	3976	4472	5015	5607	6253	6957
TOTAL :		(TONS)	14630	15690	16826	18042	19344	20737	22230	23827	25535	27363	29318	31409	33643	36030	38580
GRAND TOTAL OF THE 4 MUNICIPALITIES :		(TONS)	56117	62361	69342	77158	85925	95776	106866	119375	133512	149524	167693	188355	211897	238775	269522
SUPPLY																	
TOTAL TO THE SOUTHERN OF CHENGJIANG		(TONS)	319000	349500	369100	385000	402500	422000	443700	465500	475600	481600	481800	482000	482200	482400	482700
ESTIMATED LPG SUPPLY TO THE 4 MUNICIPALITIES :		(TONS)	34500	37700	39900	41600	43500	45600	47900	50300	51400	52000	52000	52100	52100	52100	52100
DEDUCED SHORTAGE OF SUPPLY :		(TONS)	21617	24661	29442	35558	42425	50176	58966	69075	82112	97524	115693	136255	159797	186675	217422
POTENTIAL SUPPLY BY THE COMPANY AND ITS JVs :		(TONS)	-	-	1472	3556	6364	10035	14741	20722	24634	29257	34708	40876	47939	56003	65226

REMARKS : 1. DEMAND AND LOCAL SUPPLY DATAS FOR THE FOUR MUNICIPALITIES ARE CAPTURED FROM APPENDICES 2 AND 3 RESPECTIVELY
2. POTENTIAL SUPPLY BY THE COMPANY'S JVs ARE PROJECTED WITH 5% SHARE IN 1993 FROM PRE-MARKETING ACTIVITIES AND THEREAFTER INCREASED BY 5% PER ANNUM UNTIL A MAXIMUM OF 30% IS REACHED WHEN ALL DEPOTS OPERATES AND COMPETITION MATURES

FINANCIAL EVALUATION FOR LPG DEPOT INVESTMENT IN FOUR SEZs OF PRC — APPENDIX 5

****

LPG FOR THE JVs	UNIT PROCEEDS	4.00 HK$\KG
	UNIT CIF	1.90 HK$\KG
	UNIT GROSS MARGIN	2.10 HK$\KG
	LESS:	
	UNIT OPERATING COST	0.75 HK$\KG
	UNIT NET MARGIN	1.35 HK$\KG

ECONOMIC LIFE: 10 YR AFTER ALL DEPOTS OPERATE AROUND YEAR 1996

TAX RATE : ASSUMING THAT THE DEPOT WILL SECURE THE STANDARD TAX PREFERENTIAL TREATMENT - 2 YEARS FREE AND 3 YEARS HALVED

YEAR	1996	1997	1998	1999	2000 THEREAFTER					
	0.0%	0.0%	8.3%	8.3%	8.3%	16.5%	16.5%	16.5%	16.5%	16.5%

YEAR	1996	1997	1998	1999	2000 THEREAFTER					
INFLAT. RATE	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
UNIT G. MARGIN GROWTH	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%

ESTIMATE SALES (TON) : CAPTURED FROM THE REALIZABLE VOLUME OF THE JVs IN APPENDIX 4

YEAR	1	2	3	4	5	6	7	8	9	10
LPG FOR THE JV	10035	14741	20722	24634	29257	34708	40876	47939	56003	65226

1

YEAR	1	2	3	4	5	6	7	8	9	10
MOD FACTOR(BASE YR 95)	1.10	1.21	1.33	1.46	1.61	1.77	1.95	2.14	2.36	2.59
95 RT FACTOR	0.91	0.83	0.75	0.68	0.62	0.56	0.51	0.47	0.42	0.39
MARGIN GROWTH FACTOR	1.01	1.02	1.03	1.04	1.05	1.06	1.07	1.08	1.09	1.10

(IN HK$'000)

YEAR	1	2	3	4	5	6	7	8	9	10
GROSS MARGIN	23,413	38,210	59,675	78,815	103,997	137,067	179,344	233,680	303,289	392,447
OPERATING COSTS	8,362	13,646	21,313	28,148	37,142	48,953	64,051	83,457	108,318	140,160
MARGIN	15,051	24,563	38,363	50,667	66,855	88,115	115,292	150,223	194,972	252,287
ACC MARGIN	15,051	39,614	77,977	128,644	195,499	283,614	398,906	549,128	744,100	996,387

CAP. ALLOWANCE : 10% RESIDUE VALUE WITH THE BALANCE EQUALLY SPREAD THROUGHOUT THE CONTRACT PERIOD

YEAR	1	2	3	4	5	6	7	8	9	10
CAPEX	200,000	0	0	0	0	0	0	0	0	0
CAP ALLOWANCE	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
CUM C A	18,000	36,000	54,000	72,000	90,000	108,000	126,000	144,000	162,000	180,000
PROFIT/(LOSS)	-2949	6563	20363	32667	48855	70115	97292	132223	176972	234287
TAX LOSS C/F	-2949	0	0	0	0	0	0	0	0	0
TAXABLE INCOME	0	3614	20363	32667	48855	70115	97292	132223	176972	234287
TAX PAYABLE	0	0	1,680	2,695	4,031	11,569	16,053	21,817	29,200	38,657
TAX PAYMENT	0	0	0	1,680	2,695	4,031	11,569	16,053	21,817	67,858

TRADE DEBITOR 30 DAYS

(STOCK AND TRADE CREDIT ARE NOT INCL. AS THEY ARE INSIGNIFICANT TO OVERALL BUSINESS VALUE AFTER OFFSETTING)

YEAR	1	2	3	4	5	6	7	8	9	10
WORKING CAPITAL	3,665	5,982	9,342	12,339	16,281	21,459	28,077	36,584	47,482	61,440
INC/(DEC) IN WC		2,317	3,361	2,997	3,942	5,177	6,619	8,507	10,898	(4[illegible]16)

YEAR	1	2	3	4	5	6	7	8	9	10
TOTAL CASH INFLOW	15,051	24,563	38,363	50,667	66,855	88,115	115,292	150,223	194,972	252,287

TOTAL CASH OUTFLOW	200,000	2,317	3,361	4,676	6,637	9,208	18,188	24,560	32,715	24,041

CASH FLOWS

YEAR	1	2	3	4	5	6	7	8	9	10
Net cash fl (MOD)	-184949	22247	35002	45991	60218	78907	97105	125663	162257	228246
Acc cash fl (MOD)	-184949	-162702	-127700	-81710	-21492	57415	154520	280182	442440	670685
Net cash fl (95 RT)	-168135	18386	26298	31412	37390	44541	49830	58623	68813	87999
Acc cash fl (95 RT)	-168135	-149750	-123452	-92040	-54649	-10109	39721	98344	167157	255155

Results

NPV @ 8%	93,493
RTEP post tax	17.89%
PAYBACK (RT)	7 YRS

REMARKS :
1. UNIT PROCEED, COST OF PRODUCT AND OPERATING COST ARE THE ESTIMATED FIGURES PRODUCED WITHIN THE COMPANY FOR FUTURE BUSINESS PLAN
2. INFLATION FACTORS ARE THE LATEST ESTIMATE JOINTLY PRODUCED BY THE COMPANY'S ECONOMIC ANALYST WITH THE IUPUT FROM OUTSIDE BANKERS
3. INVESTMENT LEVELS ASSUMED FROM PAST ACTUAL EXPERIENCE IN SHEKOU AND ADJUSTED FOR SUITABLE SCALE AND INFLATED TO 1996 MONEY
4. FOR SIMPLICITY, THE CAPITAL INVESTMENT IS INPUT IN A LUM SUM TO 1996